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EXAMINER
MENBERU, BENIYAM

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Please find below and/or attached an Office communication concerning this application or proceeding.

HK

Office Action Summary	Application No. 09/741,099	Applicant(s) FUJITA, TORU
	Examiner Beniyam Menberu	Art Unit 2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: Detailed Action

Response to Arguments

Applicant's arguments, see pages 12-17, filed December 27, 2004, with respect to the rejection(s)of claim(s) 1-4 and 10-19 under U.S. Patent No. 5253082 to Hayashi et al in view of U.S. Patent No. 6111664 to Aoki et al further in view of U.S. Patent No. 5982990 to Gondek and claims 5,7-9 under U.S. Patent No. 5253082 to Hayashi et al in view of U.S. Patent No. 6111664 to Aoki et al further in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent No. 6697167 to Takahashi and claim 6 under U.S. Patent No. 5253082 to Hayashi et al in view of U.S. Patent No. 6111664 to Aoki et al further in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent 5357354 to Matsunawa et al have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek for claims 1-4, 10, 11, 13-19 and U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent no. 6697167 to Takahashi for claims 5, 7, 8, and 9 and U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent No. 5357354 to Matsunawa et al for claim 6 and U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent No. 5828397 to Goto et al for claim 12.

Specification

1. The disclosure is objected to because of the following informalities:

In the Amended Specification, on page 2, line 2 of the first amended paragraph, reference 22 is specified as index matrix while in the amended drawing Figure 2, it is labeled "22: Index Table".

In the Amended Specification, on page 3, line 2, "S68" should be "68".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 10, 11, 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek.

Regarding claims 1 and 18, Narushima et al disclose an image processing apparatus/program (page 1, paragraph 9), which uses input tone data for a first color space image to generate reproduction data that express a halftone for an image, comprising:

a halftone processor for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of

said tone data for said second color space and said image reproduction data (column 43, lines 3-13;column 41, lines 54-60),

wherein a gamma characteristic A, for said input tone data for said first color space, and an output density relative to a tone value for each brightness level of an image, corresponds to a gamma characteristic B, for said halftone table, and an output density relative to tone value for each brightness level of an image (column 27, lines 64-67; column 28, lines 1-44;column 41, lines 19-32; column 7, lines 34-39; By definition gamma characteristic is relation between output density and tone value of input. Thus since Narushima et al disclose that characteristic of the display and the printing can be equated this will result in the gamma characteristic being equivalent, therefore at each brightness level output densities for both the input tone data for said first color space and for said halftone table can be equivalent.). However Narushima et al does not disclose a color converter, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said first color space into tone data for a second color space.

Gondek discloses a color converter, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said first color space into tone data for a second color space (Gondek discloses a color conversion table for converting RGB to CMYK using interpolation (column 7, lines 25-30;column 9, lines 29-33).).

Narushima et al and Gondek are combinable because they are in the same problem area of image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the color conversion with interpolation of Gondek with the system of Narushima et al to implement interpolation in the color conversion section of Narushima et al.

The motivation to combine the reference is clear because interpolation improves the efficiency of the memory used for color conversion.

Regarding claim 2, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Narushima et al in view of Gondek disclose an image processing apparatus according to claim 1, wherein said first color space is a color space for an additive mixture of color stimuli, and said second color space is a color space for a subtractive mixture of color stimuli (Gondek: color stimuli (Gondek discloses a color conversion table for converting RGB (additive color space) to CMYLCLmK (subtractive color space (column 7, lines 25-30)); and wherein a difference, for said gamma characteristic A, between a ratio for a first input tone area of the change of said output density to the change of a first input tone value, and a ratio for a second input tone area of the change of said output density to the change of a second input tone value, which is lower than said first input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B, between a ratio for a third input tone area of the change of said output density to the change of a third input tone value, and a ratio for a fourth input tone area of the change of said output density to the change of a fourth input tone value, which is higher than said third input tone value for said third input tone area (column 27, lines 64-67; column 28, lines 1-44;column 41, lines 19-32; column 7,

lines 34-39; By definition gamma characteristic is relation between output density and tone value of input. Thus since Narushima et al disclose that characteristic of the display and the printing can be equated this will result in the gamma characteristic being equivalent, therefore at each brightness level output densities for both the input tone data for said first color space and for said halftone table can be equivalent. Thus if the density characteristic in relation to input tone value is equated, the difference in ratio of changes of density to change of input tone at different tone areas would also be equated for both characteristics A and B).

Regarding claim 3, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Narushima et al in view of Gondek disclose an image processing apparatus according to claim 1, wherein said first color space is a color space for a subtractive mixture of color stimuli, and said second color space is a color space for a subtractive mixture of color stimuli (Gondek: column 11, lines 24-30); and wherein a difference, for said gamma characteristic A, between a ratio for a first input tone area of the change of said output density to the change of a first input tone value, and a ratio for second input tone area of the change of said output density the change of a second input tone value, which is lower than said first input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B, between a ratio for a third input tone area of the change of said output density to the change of a third input tone value, and a ratio for fourth input tone area of the change of said output density to the change of a fourth input tone value, which is lower than said third input tone value for said third input tone area (see rejection of claim 2).

Regarding claim 4, Narushima et al in view of Gondek teach all the limitations of claim 2, wherein said color space for said additive mixture of color stimuli is either an RGB color space, an SRGB color space, a CIEXYZ color space or a CIELab color space, and said color space for said subtractive mixture of color stimuli is a CMYK color space (Gondek discloses a color conversion table for converting RGB to CMYLCLmK (column 7, lines 25-30)).)

Regarding claim 10, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Gondek discloses an image processing apparatus according to claim 1, wherein said first color space is a CIELab color space and said second color space is a CMYK color space (Gondek discloses that input can be of the form CIEL*a*b* and the output is CMYLCLmK (column 11, lines 24-30).), and wherein a gamma characteristic of L* in said first color space is the same as a gamma characteristic of L* of said half tone table (Narushima et al: column 78, lines 30-40; column 47, lines 55-67; column 48, lines 1-7).

Regarding claim 11, Narushima et al in view of Gondek teach all the limitations of claim 1, and Gondek discloses a color conversion method and apparatus wherein said first color space is a CIELab color space or a CIEXYZ color space; and said second color space is a CMYK color space (Gondek discloses that input can be of the form CIEL*a*b* and the output is CMYLCLmK (column 11, lines 24-30).).

Regarding claims 13 and 19, Narushima et al disclose the image processing apparatus/program for generating, using input tone data for an RGB color space, image reproduction data that express tones by using a plurality of printing dots comprising:
a halftone processor for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of said tone data for said CMYK color space and said image reproduction data (column 43, lines 3-13;column 41, lines 54-60),
wherein, for a gamma characteristic A for an output density relative to a tone value said input tone data for said RGB color space, a difference between a ratio for a first RGB tone area the change of said output density to the change of a first input tone value, and a ratio for a second RGB tone area of the change of said output density to the change of second input tone value, which is lower than said first input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B of said halftone table, between a ratio for a first CMYK input tone area of the change of said output density to the change of a third input tone value, and a ratio for a second CMYK input tone area the change of said output density to the change of a fourth input tone value, which is higher than said third input tone value for said first CMYK input tone area(column 27, lines 64-67; column 28, lines 1-44;column 41, lines 19-32; column 7, lines 34-39; By definition gamma characteristic is relation between output density and tone value of input.Thus since Narushima et al disclose that characteristic of the display and the printing can be equated this will result in the gamma characteristic being equivalent, therefore at each brightness level output densities for both the input tone

data for said first color space and for said halftone table can be equivalent. Thus if the density characteristic in relation to input tone value is equated, the difference in ratio of changes of density to change of input tone at different tone areas would also be equated for both characteristics A and B). However Narushima et al does not disclose a color converter, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said RGB color space into tone data for a CMYK color space; and

Gondek discloses a color converter, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said RGB color space into tone data for a CMYK color space (Gondek discloses a color conversion table for converting RGB to CMYK using interpolation (column 7, lines 25-30;column 9, lines 29-33).).

Narushima et al and Gondek are combinable because they are in the same problem area of image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the color conversion with interpolation of Gondek with the system of Narushima et al to implement interpolation in the color conversion section of Narushima et al.

The motivation to combine the reference is clear because interpolation improves the efficiency of the memory used for color conversion.

Regarding claim 14, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Narushima et al disclose an electrophotographic apparatus comprising:

an image processing apparatus according to claim 1; and

a print engine for printing an image in accordance with image reproduction data (Figure 14, reference 56, 25).

Regarding claim 15, Narushima et al in view of Gondek teach all the limitations of claim 13. Further Narushima et al discloses an electrophotographic apparatus comprising:

an image processing apparatus according to claim 13. and

a print engine for printing an image in accordance with image reproduction data (Figure 14, reference 56, 25).

Regarding claim 16, Narushima et al in view of Gondek teach all the limitations of claim 14. Further Narushima et al disclose an electrophotographic apparatus according to claim 14, wherein said print engine emits a laser beam in accordance with said image reproduction data to form a latent image, and attaches toner for a color space to said latent image (column 29, lines 15-24).

Regarding claim 17, Narushima et al in view of Gondek teach all the limitations of claim 15. Further Narushima et al disclose an electrophotographic apparatus according to claim 15, wherein said print engine emits a laser beam in accordance with said image reproduction data to form a latent image, and attaches toner for said color space to said latent image (column 29, lines 15-24).

4. Claims 5, 7, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent no. 6697167 to Takahashi.

Regarding claim 5, Narushima et al in view of Gondek teach all the limitations of claim 3. However, Narushima et al in view of Gondek does not disclose a color conversion wherein said color space for said subtractive mixture of color stimuli is a CMYK color space.

Takahashi discloses a color conversion wherein said color space for said subtractive mixture of color stimuli is a CMYK color space (Takahashi discloses a gamma correction unit (Figure 3b, reference 312) that takes as input YMCK color (subtractive color space) and performs processing using a conversion table (column 24, lines 39-41) and interpolation (column 13, lines 63-67, column 14, lines 1-5) to output CMYK color space.).

Narushima et al, Gondek, and Takahashi are combinable because they are in the same problem area of color image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine CMYK color conversion of Takahashi with the system of Narushima et al in view of Gondek to implement CMYK based imaging system.

The motivation to combine the reference is clear because when the input is CMYK space data the system of Takahashi can process the data.

Regarding claim 7, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Narushima in view of Gondek further in view of Takahashi disclose an

image processing apparatus according to claim 1, wherein said first color space is a first CMYK color space, and said second color space is a second CMYK color space (Takahashi discloses a gamma correction unit (Figure 3b, reference 312) that takes as input YMCK color (subtractive color space) and performs processing using a conversion table (column 24, lines 39-41) and interpolation (column 13, lines 63-67, column 14, lines 1-5) to output CMYK color space.); wherein, for said gamma characteristic A, a ratio in a first input tone area for change in said output density to the change in a first input tone value is smaller than a ratio a second input tone area for the change in said output density to the change in a second input tone value, which is lower than said first input tone value said first input tone area; and wherein, for said gamma characteristic B, ratio a third input tone area for the change in said output density to the change in a third input tone value is smaller than a ratio fourth input tone area for the change in said output density to the change in a fourth input tone value, which is lower than said third input tone value in said third input tone area (Takahashi discloses an apparatus (Figure 3b, reference 312) that converts from CMYK to CMYK color space. Further, the gamma characteristic of reference 312 can be of the curve shown in Figure 26 (reference 1903b). This curve can be matched by the process of claim 1, so that both the input color converter and the halftoning process can have corresponding density characteristics. For medium input level of the curve shown in 1903b, the change in density to change in input level increases as input level decreases. For the halftoning process, which is in the CMYK space similar to the input color space, the curve of 1903b will be mirrored. Thus the change in density to change

in input level increases as input level decreases.).

Regarding claim 8, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Takahashi discloses an image processing apparatus, wherein said gamma characteristic A and said gamma characteristic B have the same non-linear characteristic (Takahashi discloses a gamma correction unit (Figure 26, reference 312) that has a non-linear characteristic (Figure 26, reference 1903b). Thus if the half toning is matched with this non-linear characteristic of the input as described in claim 1, then gamma characteristic A and gamma characteristic B will be the same non-linear characteristic.).

Regarding claim 9, Narushima et al in view of Gondek teach all the limitations of claim 1. Further Takahashi discloses an image processing apparatus, wherein said gamma characteristic A and said gamma characteristic B have the same S-shaped characteristic (Takahashi discloses a gamma correction unit (Figure 26, reference 312) that has an S-shaped characteristic (Figure 26, reference 1903b). Thus if the half toning is matched with this S-shaped characteristic of the input as described in claim 1, then gamma characteristic A and gamma characteristic B will be the same S-shaped characteristic.).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent No. 5357354 to Matsunawa et al.

Regarding claim 6, Narushima et al in view of Gondek teaches all the limitations of claim 1. Narushima et al in view of Gondek disclose an image processing apparatus,

wherein said first color space is either an RGB, an SRGB or a CIELab color space, and said second color space is a CMYK color space (Gondek discloses a color conversion table for converting RGB to CMYK using interpolation (column 7, lines 25-30;column 9, lines 29-33).). Narushima et al in view of Gondek disclose an apparatus for equalizing the characteristics the display apparatus and the display device which correspond to gamma characteristic A and B respectively. However Narushima et al in view of Gondek does not disclose wherein, for said gamma characteristic A, a ratio in a first input tone area for the change in said output density to the change in a first input tone value is smaller than a ratio in a second input tone area for the change in said output density to the change in a second input tone value, which is lower than said first input tone value in said first input tone area; and wherein, for said gamma characteristic B, a ratio in a third input tone area for the change in said output density to the change in a third input tone value is greater than a ratio in a fourth input tone area for the change in said output density to the change in a fourth input tone value, which is lower than said third input tone value in said third input tone area.

Matsunawa et al disclose in Figure 9, a gamma characteristic A of the RGB data wherein at high luminance level the change in density to change in luminance level is small compared to the same at lower luminance level since the slope of the curve Lc is smaller at high luminance and bigger at low luminance level. The reverse is true for the matched gamma characteristic of the halftoning since it is in the CMYK space (low RGB level corresponds to high CMYK level). For the halftoning process, the change in density to change in input at low input level is smaller than the corresponding

value at higher input level. Thus in combination with the system of Narushima et al in view of Gondek, the gamma characteristic B can be matched with characteristic A, thus the characteristic B can behave similarly.

Narushima et al, Gondek, and Matsunawa et al are combinable because they are in the same problem area of color image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the gamma characteristic of the system of Matsunawa with the system of Narushima et al in view of Gondek to implement matched gamma characteristic.

The motivation to combine the reference is clear because Matsunawa et al provide for an option to adjust the input RGB characteristic to the desired characteristic and color balance (column 7, lines 52-56).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6831755 to Narushima et al in view of U.S. Patent No. 5982990 to Gondek further in view of U.S. Patent No. 5828397 to Goto et al.

Regarding claim 12, Narushima et al in view of Gondek teach all the limitations of claim 1, and Gondek discloses a color converstion table, wherein said color conversion table includes a discrete relationship between said input tone data for said first color space and said tone data for said second color space (Gondek discloses a color conversion table (column 7, lines 25-29) wherein the input signals are at discrete points (column 7, lines 55-66; column 8, lines 1-46). Thus there is discrete relationship between input and output), However Narushima et al in view of Gondek does not

disclose wherein said halftone table includes a continuous relationship between said input tone data for said first color space and said tone data for said second color space.

Goto et al disclose wherein said halftone table includes a continuous relationship between said input tone data for said first color space and said tone data for said second color space (column 1, lines 20-28; Figure 14 shows continuous relationship between tone and density for the printing (column 12, lines 39-67)).

Narushima et al, Gondek, and Goto et al are combinable because they are in the same problem area of color image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine continuous relationship of input and output data of Goto et al with the system of Narushima et al in view of Gondek to implement an accurate halftoning process.

The motivation to combine the reference is clear because if the relationship of input tone to output tone data is continuous, the halftoning conversion process will be more accurate and smooth.

Other Prior Art Cited

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5568572 to Shu discloses tonal correction for printing.

U.S. Patent No. 5712930 to Watanabe disclose gamma correction apparatus.

U.S. Patent No. 5610726 to Nonoshita et al disclose image processor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beniyam Menberu whose telephone number is (571) 272-7465. The examiner can normally be reached on 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on (571) 272-7471. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is (571) 272-2600. The group receptionist number for TC 2600 is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov/>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patent Examiner

Beniyam Menberu

BM

05/29/2005

KA Williams

KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER